US nuclear deterrence policy and its problems

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Peter Rudolf

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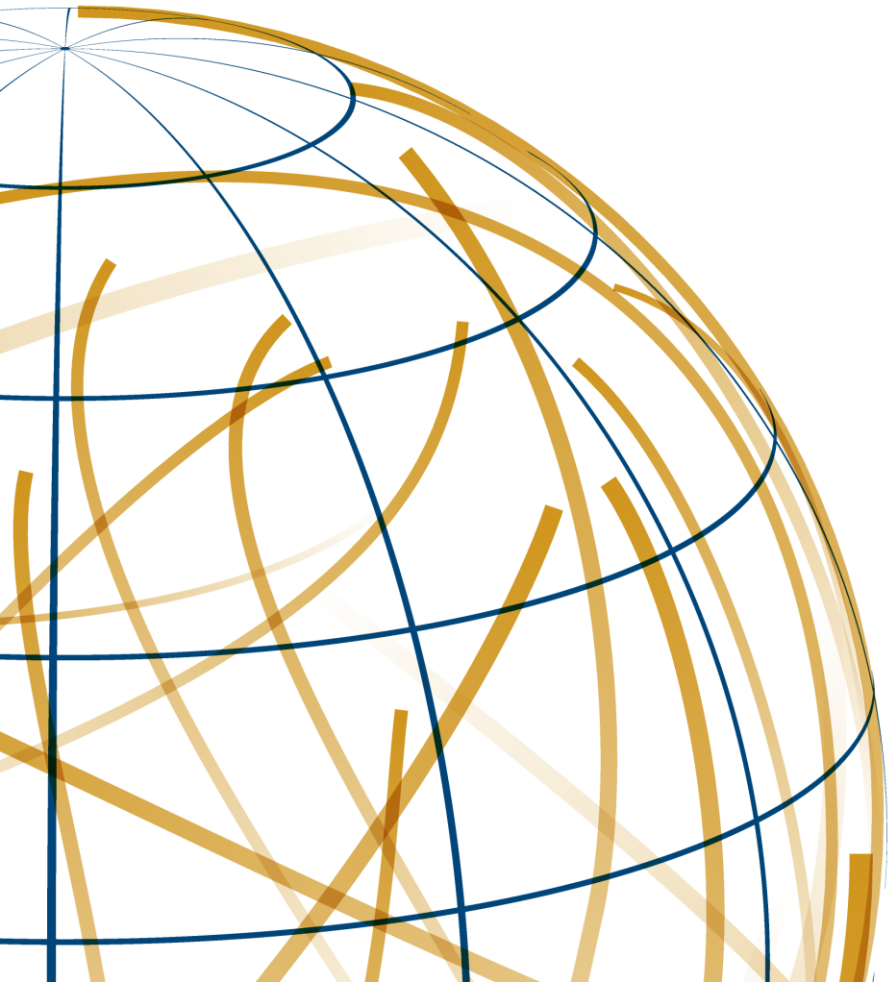

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Nuclear deterrence is back. Of course, it had never disappeared, but retreated into the background as a hedge against future uncertainties. Hopes of overcoming the deterrence system through nuclear disarmament have been dashed. Nuclear deterrence gains new importance in the era of great power competitions. Arms control is stagnating, even eroding, and the modernisation of nuclear arsenals is progressing.

Through nuclear sharing arrangements within the North Atlantic Treaty Organization (NATO), Germany is involved in nuclear deterrence. This includes the ability to deliver American nuclear bombs stored in Germany. So far, this has been ensured by nuclear-capable Tornado fighter bombers, due to be replaced in the foreseeable future.

Against this background, nuclear deterrence and its strategic, legal, ethical, and political problems and dilemmas are assessed in this research paper. The focus is on US deterrence policy and its role in the Western alliance. This analysis of nuclear deterrence and its problems and dilemmas is intended to provide a basic orientation for the new nuclear debate that is emerging.

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US Nuclear Deterrence Policy and Its Problems

Nuclear deterrence is back. Of course, it had never disappeared, but retreated into the background as a hedge against future uncertainties. Hopes of overcoming the deterrence system through nuclear disarmament have been dashed. Nuclear deterrence gains new importance in the era of great power competitions. Arms control is stagnating, even eroding. The coalition agreement of 2018 states: "As long as nuclear weapons play a role as an instrument of deterrence in NATO's strategic concept, Germany has an interest in participating in the strategic discussions and planning processes." To date, nuclear sharing has included the ability to deliver American nuclear bombs stored in Germany. So far, this has been ensured by nuclear-capable Tornado fighter bombers, due to be replaced in the foreseeable future.

Against this background, nuclear deterrence and its strategic, legal, ethical, and political problems and dilemmas are assessed in this research paper. The focus is on US deterrence policy and its role in the Western alliance. This analysis of nuclear deterrence and its aporias is intended to provide a basic orientation for the new nuclear debate that is emerging.

In the context of "extended deterrence", US nuclear weapons have the function of deterring attacks against allied states. The problem of credibly deterring possible aggression against allies under conditions of mutual nuclear vulnerability has had a major impact on US nuclear doctrine, at both the declaratory and operational levels. Deterrence in the American understanding is based on the ability to have multiple, graduated nuclear options that are primarily directed against the military capabilities of a potential enemy, including missile silos, airports, strategic submarine bases, and control and communication facilities. With this so-called counterforce orientation, the credibility of the deterrent threat is to be increased and, in the event of war, the damage (for one's own side) is to be limited as far as possible.

Following the strategic logic of such a "conventionalisation" of nuclear deterrence, it is deemed necessary to prepare for a wide a range of scenarios and to have options at hand that correspond to those of the adversary. In a military conflict, one's own scope of

action is to be expanded and the burden of further escalation imposed on the other side. According to this logic, which is also reflected in the 2018 Nuclear Posture Review (NPR), the United States needs a range of nuclear options that can be used in a controlled manner, including low-yield nuclear weapons in particular. The hope is that, once war has broken out, nuclear escalation can remain controlled. But, as during the East-West conflict, US war planners can come up with only one answer to the problem of how to limit and end a nuclear war: namely by having as many flexible options as possible, including the rarely mentioned capacity for pre-emptive options against enemy nuclear weapons. The combination of targeted nuclear and conventional weapons as well as advances in strategic anti-submarine warfare and cyber-warfare have expanded the possibilities for neutralising enemy nuclear weapons to such an extent that, in the US debate, there is talk about a "counterforce revolution".

According to thinking in the United States, counterforce targeting allows for using nuclear weapons in a way that does not contradict the fundamental norms of international humanitarian law, which are the principles of distinction and proportionality. From this point of view, the legality of nuclear deterrence presupposes the possibility for the lawful use of nuclear weapons. This approach of legitimising the use of nuclear weapons focusses on targeted strikes of low-yield nuclear weapons against military objects. However, these objects are understood in a very broad sense that is considered controversial under international law. The uncontrollable consequences from the use of nuclear weapons, that is, radioactive fallout and radiation, are ignored just as much as the cumulative effects from a series of low-yield weapons bursts.

Counterforce strategies are, as their proponents argue, a way out of the fundamental moral dilemma posed by nuclear deterrence. The basic objection, it is claimed, loses its validity if nuclear weapons can be used in such a way that civilians are not attacked intentionally and deterrence does not take the enemy population hostage. But the arguments put forward by proponents of such a deterrence policy are contradictory: On the one hand, the unique nature of nuclear weapons is denied by claiming the possibility of their morally tolerable use; on the other hand, it is argued that nuclear deterrence "works" because it is based on the risk of uncontrollable escalation and incalculable costs.

Under the conditions of the East-West confrontation, there was the widespread expectation that nuclear deterrence based on the capacity of mutual destruction could permanently prevent war and secure "nuclear peace". Undoubtedly, mutually assured destruction (called MAD) had a moderating effect on US and Soviet leaders during crises. However, the deterrent relationship between the United States and the Soviet Union remained strained by risks of instability. Both sides feared that the other could consider a pre-emptive strike during a serious international crisis. In the future, strategic stability could become even more fragile due to technological advances. A further development known from the time of East-West antagonism is also to be expected: the intensification of the security dilemma and, as a result, an ongoing arms race. Deterrence presupposes the aggressiveness of the state that is to be deterred. As long as this state has military capabilities that appear threatening in a worst-case scenario, it remains the potential enemy that only deterrence can keep in check.

Extended Deterrence and US Nuclear Doctrine

NATO continues to regard itself as a "nuclear alliance". In the event of a threat to a member state's fundamental security, it has "the capabilities and resolve to impose costs on an adversary that would be unacceptable and far outweigh the benefits that any adversary could hope to achieve", as most recently re-stated in the Brussels Summit Declaration of July 2018.[1] The core of nuclear deterrence can hardly be summed up better than in this formulation. Deterrence aims to influence the intentions of potential opponents, namely their cost-benefit calculation; defence aims to limit one's own costs and risks in case deterrence fails. With the development of nuclear weapons and long-range missiles and bombers, the functions of deterrence (in peace) and defence (in war), which were previously concentrated in the same weapons, were partly separated from one another. Within the framework of nuclear deterrence, nuclear weapons serve to deprive the opponent of the possibility of making a relatively straightforward cost-benefit calculation and to increase the amount of uncertainty about the overall costs of aggression.[2]

With respect to "extended deterrence", this function — namely to make the consequences from aggression incalculable and unacceptable — is designated above all to US nuclear weapons. Their task is therefore not limited to deterring an attack against the United States. They also serve to deter attacks against allied states, not only in Europe but also in Asia. The deterrent threat is ultimately based on US "strategic" nuclear weapons. There is no clear distinction between strategic and non-strategic (tactical) nuclear weapons. Tactical nuclear weapons have traditionally been understood to mean short-range battlefield weapons. To use a simple pragmatic criterion, tactical or non-strategic weapons are those that are not covered by the relevant US-Soviet/Russian treaties limiting strategic nuclear weapons (SALT treaties, START treaties).[3]

Three reasons are usually cited when it comes to the deterrent role of tactical nuclear weapons deployed on the territory of allied states.[4] Firstly, they may have direct military functions, in the sense of "deterrence by denial".[5] Secondly, they increase the risk of uncontrollable escalation. This corresponds to the logic of deterrence as a "competition in risk-taking". In this view, nuclear deterrence is not so much about military success on the battlefield, but about the resolve to take risks and embark on a process that is uncontrollable and could ultimately lead to high costs that neither side wants — and thus manipulate the common interest in avoiding nuclear war for one's own benefit.[6] Thirdly, the

1 *Brussels Summit Declaration.* Issued by the heads of state and government participating in the meeting of the North Atlantic Council in Brussels, 11—12 July 2018, Number 36.

2 See Glenn H. Snyder, *Deterrence and Defense: Toward a Theory of National Security* (Princeton, NJ: Princeton University Press, 1961), 3—5.

3 SALT (Strategic Arms Limitation Talks); START (Strategic Arms Reduction Talks). See Amy F. Woolf, *Nonstrategic Nuclear Weapons*, CRS Report (Washington, DC: Congressional Research Service [CRS], 21 February 2017), 6—8.

4 For the following, see Todd S. Sechser, "Sharing the Bomb: How Foreign Nuclear Deployments Shape Nonproliferation and Deterrence'', *The Nonproliferation Review* 23, no. 3—4 (2016): 443—58.

5 On the distinction between "deterrence by denial" and "deterrence by punishment", see Glenn H. Snyder, "Deterrence and Power", *Journal of Conflict Resolution* 4, no. 2 (1960): 163—78: "In military affairs deterrence by denial is accomplished by having military forces which can block the enemy's military forces from making territorial gains. Deterrence by punishment grants him the gain but deters by posing the prospect of war costs greater than the values of the gain" (p. 163).

6 Thomas C. Schelling, *Arms and Influence* (New Haven, CT, and London: Yale University Press, 1966), esp. ch. 3; see further Robert Jervis, *The Illogic of American Nuclear Strategy*

forward-deployment of tactical nuclear weapons has a signalling function. In terms of alliance policy, they serve to reassure allies. Even if militarily their deterrent roles might be obsolete, a change in the status quo could be interpreted as a politically questionable message.

In the 1950s, the United States deployed tactical nuclear weapons in Western Europe as a counterweight to the conventional superiority of the Warsaw Pact. Nuclear deterrence gained great political and symbolic importance for NATO. This did not change when, in the early 1990s, the George H. W. Bush administration withdrew tactical nuclear weapons from Europe — with the exception of those 160 to 200 American B61 nuclear bombs stationed at bases in Belgium, Germany, Italy, the Netherlands, and Turkey.[7] They no longer had a real military function,[8] but they remained the embodiment of the American nuclear guarantee, even at a time when the former threat had long disappeared and a resurgent Russia was only a distant possibility. Although over the decades following the end of the East-West confrontation the deterrent rationale for the continued presence of tactical nuclear weapons was thin, their symbolic significance and NATO's consensus-based decision-making procedures ensured that the status quo established in the early 1990s remained in place. There was no noteworthy political pressure to change this — apart from the bogged down German initiative in 2009/10 calling for the removal of American nuclear weapons from its territory. In NATO, nuclear issues have been handled so as to draw as little public attention as possible; in the societies of the member states, nuclear deterrence ceased to be a salient political issue after the East-West confrontation had ended.[9]

The role of extended deterrence has shaped American nuclear doctrine to a considerable extent.

The role of extended deterrence has shaped American nuclear doctrine to a considerable extent. US nuclear weapons policy has been characterised by substantial continuity for more than four decades. This applies to both declaratory and operational nuclear policy. Declaratory policy has the function of communicating one's own capabilities and intentions, not only to potential opponents, but also to allied states. It aims at political and perceptual effects and contains a certain degree of ambiguity in order to maintain flexibility in a crisis situation. However, declaratory policy should not deviate too much from what is actually planned operationally.[10]

Even Barack Obama's administration did not break with the substantial continuity of declaratory policy following the end of the East-West confrontation. Although Obama adopted the vision of a nuclear weapons-free world and wanted to push ahead with negotiated disarmament, he did not shake the pillars of nuclear deterrence.[11] Thus, contrary to some expectations, even under President Barack Obama there was no renunciation of the policy of first use of nuclear weapons. A proposal to this effect was consid-

(Ithaca, NY, and London: Cornell University Press, 1984), 126—46.

7 See Woolf, *Nonstrategic Nuclear Weapons* (see note 3), 13—15.

8 "Given the above-mentioned insight that nuclear weapons have to be militarily usable (in a plausible manner) in order to have a political deterrence effect, the conceptual plausibility of NATO's nuclear bombs on European soil in today's security environment is close to nil." Karl-Heinz Kamp and Robertus C. N. Remkes, "Options for NATO Nuclear Sharing Arrangements", in *Reducing Nuclear Risks in Europe: A Framework for Action*, ed. Steve Andreasen and Isabelle Williams (Washington, DC, 2011), Nuclear Threat Initiative, 76—95 (83).

9 See Trine Flockhart, "NATO's Nuclear Addiction — 12 Steps to 'Kick the Habit'", *European Security* 22, no. 3 (2013): 271—87. See also Martin A. Smith, "To Neither Use Them Nor Lose Them: NATO and Nuclear Weapons since the Cold War", *Contemporary Security Policy* 25, no. 3 (December 2004): 524—44; Michael Paul, *Atomare Abrüstung. Probleme, Prozesse, Perspektiven*, Schriftenreihe vol. 1248 (Bonn: Bundeszentrale für politische Bildung, 2011), 39—45.

10 So Paul H. Nitze, "Atoms, Strategy and Policy", *Foreign Affairs* 34, no. 2 (January 1956): 187—98, who distinguishes between "declaratory policy" and "action policy", which in today's parlance is called "employment policy" or "operational policy". On the functions of "declaratory policy", see Snyder, *Deterrence and Defense* (see note 2), 240—41, 246.

11 See Harald Müller and Annette Schaper, *US-Nuklearpolitik nach dem Kalten Krieg*, HSFK-Report no. 3/2003 (Frankfurt am Main: Hessische Stiftung Friedens- und Konfliktforschung [HSFK], 2003); Amy F. Woolf, *U.S. Nuclear Weapons: Changes in Policy and Force Structure* (Washington, DC: CRS, 23 January 2008); Charles J. Moxley, Jr., "Obama's Nuclear Posture Review: An Ambitious Program for Nuclear Arms Control But a Retreat from the Objective of Nuclear Disarmament", *Fordham International Law Journal* 34 (2011): 734—75; Marco Fey, Giorgio Franceschini, Harald Müller and Hans-Joachim Schmidt, *Auf dem Weg zu Global Zero? Die neue amerikanische Nuklearpolitik zwischen Anspruch und Wirklichkeit*, HSFK-Report no. 4/2010 (Frankfurt am Main: HSFK, 2010).

ered towards the end of Obama's second term, but it was met with rejection by the Secretaries of State, Defense, and Energy as well as allies in Europe and Asia. The Obama administration maintained the traditional policy of "calculated ambiguity", according to which the first use of nuclear weapons is not categorically excluded, but the conditions under which it could occur are not specified. The Nuclear Posture Review Report of 2010 and the Nuclear Employment Strategy of 2013 state that the use of nuclear weapons will only take place "in extreme circumstances" in order to defend the vital interests of the United States, its allies, and its partners. The threat and use of nuclear weapons against non-nuclear weapon states that are members of the Non-Proliferation Treaty and comply with their treaty obligations are ruled out.[12] In the 2018 Nuclear Posture Review, there is an addition to the "extreme circumstances" under which the use of nuclear weapons might be considered, namely in case of "significant non-nuclear strategic attacks",[13] which are probably to be understood as cyberattacks against the civilian population, infrastructure, as well as nuclear weapons and, in particular, their command-and-control facilities.

US nuclear doctrine is characterised by considerable continuity.

Although the United States has considerably reduced the number of its nuclear weapons compared to the East-West confrontation period, it has not broken with traditional nuclear doctrine at the level of operational strategy. On the one hand, this applies to the structure of the nuclear posture; nothing has changed in the triad of land-based intercontinental missiles, sea-based missiles, and bombers. This also applies to the option of being able to make the decision to use nuclear weapons under extreme time pressure if the early warning systems report the launch of enemy missiles ("prompt launch"). This serves to prevent the worst-case scenario that US nuclear weapons are taken out by a first strike. Continuity also extends to target planning, which is guided by a counterforce approach. This involves the elimination of enemy military capabilities, in particular nuclear capabilities; that is, the targets include enemy missile silos, airports, strategic submarine bases, and control and communication facilities.[14] US nuclear deterrence policy does not "rely" on a so-called countervalue strategy.[15] Countervalue targets are "softer" targets. In today's understanding, this does not mean cities, but, for example, industrial facilities that contribute to the ability to wage war.[16] But even such targets can be covered

12 See Department of Defense, *Nuclear Posture Review Report* (Washington, DC, April 2010), IX, https://www.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf (accessed 2 May 2018); Department of Defense, *Report on Nuclear Employment Strategy of the United States Specified in Section 491 of 10 U.S.C.* (June 2013), 4, https://www.globalsecurity.org/wmd/library/policy/dod/us-nuclear-employment-strategy.pdf (accessed 2 May 2018). In addition, see Amy Woolf, *U.S. Nuclear Weapons Policy: Considering "No First Use"*, CRS Insight (Washington, DC: CRS, 16 August 2016).

13 Department of Defense, *Nuclear Posture Review* (February 2018), 21, https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF (accessed 2 May 2018). On the Nuclear Posture Review, see Oliver Meier, "The U.S. Nuclear Posture Review and the Future of Nuclear Order", Commentary, *European Leadership Network*, 2 March 2018; Wolfgang Richter, *Erneuerung der nuklearen Abschreckung*, SWP-Aktuell 15/2018 (Berlin: Stiftung Wissenschaft und Politik, March 2018); Oliver Thränert, *Präsident Trumps Kernwaffendoktrin*, CSS Analysen zur Sicherheitspolitik no. 223 (Zurich: Center for Security Studies, March 2018).

14 "Counterforce Targeting. Counterforce targeting is a strategy to employ forces to destroy, or render impotent, military capabilities of an enemy force. Typical counterforce targets include bomber bases, ballistic missile submarine bases, ICBM silos, antiballistic and air defense installations, C2 centers, and WMD storage facilities. Generally, the nuclear forces required to implement a counterforce targeting strategy are larger and weapon systems more accurate than the forces and weapons required to implement a countervalue strategy, because counterforce targets generally tend to be harder, more protected, difficult to find, and more mobile than countervalue targets." Joint Chiefs of Staff, *Doctrine for Joint Nuclear Operations*, Joint Publication 3—12 (15 December 1995), II—5, http://www.nukestrat.com/us/jcs/JCS_JP3-12_95.pdf (accessed 2 May 2018). (The original contains parts of the text in bold font.)

15 "The new guidance requires the United States to maintain significant counterforce capabilities against potential adversaries. The new guidance does not rely on a 'countervalue' or 'minimum deterrence' strategy." Department of Defense, *Report on Nuclear Employment Strategy* (see note 12), 4.

16 "Countervalue Targeting. Countervalue targeting strategy directs the destruction or neutralization of selected

because — in the view of US military leadership — deterrence is ultimately based on the capability of destroying those enemy facilities and capabilities that "a potential adversary leadership values most and that it would rely on to achieve its own objectives in a post-war world".[17] Nuclear target planning, as in Operation Plan (OPLAN) 8010—12 of July 2012, which is apparently still in force, is subject to the strictest secrecy. Therefore, it is impossible to say how the target planning differs among those countries that are considered potential adversaries — and what specific consequences the slogan "tailored deterrence", which has found its way into the 2018 NPR, entails. The notion of "tailored deterrence" serves to signal to potential opponents that they face unacceptable costs and risks that are tailored to their specific risk and cost calculations.[18] As far as official documents are concerned, the term "tailored deterrence" was first used in the 2006 Quadrennial Defense Review Report and highlights the rather trivial insight that one should know the adversaries well if one wants to influence their perceptions through deterrent threats.[19]

US nuclear doctrine focusses on the capability of having manifold counterforce options. Essentially, its proponents put forward three arguments as to why nuclear deterrence should be based on the ability to fight a nuclear war. First, there is the strategic argument: It is about the credibility of deterrence and the need to limit damage in case deterrence fails. The second argument is a legal one: Deterrence based on counterforce options makes it possible to respect the rules of international humanitarian law (in US parlance, it is usually referred to as the "law of war" or the "law of armed conflict"). Finally, the third argument claims the moral superiority of such a form of deterrence over a minimum countervalue deterrent posture.[20] These three lines of argument are examined in more detail below. This evaluation remains within the confines of deterrence thinking. In a fourth part, a retrospective and forward-looking analysis of the risks and costs of the deterrence system is presented.

enemy military and military-related activities, such as industries, resources, and/or institutions that contribute to the enemy's ability to wage war. In general, weapons required to implement this strategy need not be as numerous or accurate as those required to implement a counterforce targeting strategy, because countervalue targets generally tend to be softer and unprotected in relation to counterforce targets." Joint Chiefs of Staff, *Doctrine for Joint Nuclear Operations* (see note 14), II—5. (The original contains parts of the text in bold font.)

17 "US nuclear forces deter potential adversaries by providing the President the means to respond appropriately to an attack on the US, its friends or allies. US nuclear forces must be capable of, and be seen to be capable of, destroying those critical war-making and war-supporting as-sets and capabilities that a potential adversary leadership values most and that it would rely on to achieve its own objectives in a post-war world." Joint Chiefs of Staff, *Doctrine for Joint Nuclear Operations*, Joint Publication 3—12, Final Coordination (2) (15 March 2005), I—1—2, https://www.globalsecurity.org/wmd/library/policy/dod/jp3_12fc2.pdf (accessed 2 May 2018).

18 Department of Defense, *Nuclear Posture Review* (see note 13), VIII.

19 See, e.g., M. Elaine Bunn, *Can Deterrence Be Tailored?*, Strategic Forum no. 225 (Institute for National Strategic Studies, National Defense University, February 2007).

20 For example, Keith B. Payne, "Why US Nuclear Force Numbers Matter", *Strategic Studies Quarterly* 10, no. 2 (Summer 2016): 14—24.

The Strategic Dimension: Logic and Illogic of Counterforce Deterrence

The credibility problem of nuclear deterrence led to the search for viable options to address the problem of self-deterrence.[21] The issue became virulent when the Soviet Union expanded its nuclear arsenal during the 1960s and gained "nuclear parity" at the end of that decade. The previous strategy of "massive retaliation", as formulated in the 1950s, in fact aimed at the large-scale destruction of industrial and military targets and population centres. For example, the first Single Integrated Operation Plan (SIOP), approved by President Dwight D. Eisenhower in December 1960, contained 3,729 targets in the Soviet Union, China, North Korea, and Eastern Europe to be attacked with 3,423 nuclear weapons. About a fifth of the targets were civilian and four-fifths were military targets. According to estimates at that time — in which only the blast effects were included, since the effects of fire and radiation were difficult to measure — approximately 54 per cent of the Soviet and 16 per cent of the Chinese populations, that is, around 220 million people, would have fallen victim to these attacks within three days.[22] Despite changes in the declaratory strategy towards graduated options and "flexible response", nuclear targeting, as reflected in the SIOP, remained anything but flexible well into the 1970s.[23]

The flexibilisation of nuclear options meant that, like conventional weapons, nuclear weapons are understood as war-fighting weapons to be used with the aim of escalation dominance.[24] In classical deterrence thinking, escalation dominance means the ability to exploit one's own advantage on a certain rung of the "escalation ladder".[25] The prerequisite

21 For an early, succinct analysis, see Dieter Senghaas, "Rückblick und Ausblick auf Abschreckungspolitik", in *Politik und Ethik der Abschreckung. Beiträge zur Herausforderung der Nuklearwaffen*, ed. Franz Böckle and Gert Krell (Mainz and Munich: Grünewald/Kaiser, 1984), 98—132; Gert Krell, "Zur Problematik nuklearer Optionen", in *Kernwaffen im Ost-West-Vergleich. Zur Beurteilung militärischer Potentiale und Fähigkeiten*, ed. Erhard Forndran and Gert Krell, in collaboration with Hans-Joachim Schmidt (Baden-Baden: Nomos, 1983), 79—116.

22 See Eric Schlosser, *Command and Control* (London: Penguin Books, 2013), 206.

23 As William E. Odom, who dealt with nuclear weapons in President Jimmy Carter's National Security Council, wrote: "Looking at the SIOP and its executive plan, I realized that this was a war plan that did not allow for choosing specific war aims at the time and in the context of the outbreak of hostilities. It was just a huge mechanical war plan aimed at creating maximum damage without regard to the political context. I concluded that the United States had surrendered political control over nuclear weapons to a deterministic theory of war that depoliticized the phenomenon outright and ensured an unprecedented devastation of both the Soviet Union and the United States." William E. Odom, "The Origins and Design of Presidential Decision-59: A Memoir", in *Getting MAD: Nuclear Mutual Assured Destruction, Its Origin and Practice*, ed. Henry D. Sokolski (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, November 2004), 175—96 (183).

24 See Jervis, *The Illogic of American Nuclear Strategy* (see note 6), 56—63. On the historical development, see Niccolò Petrelli and Giordana Pulcini, "Nuclear Superiority in the Age of Parity: US Planning, Intelligence Analysis, Weapons Innovation and the Search for a Qualitative Edge 1969—1976", *The International History Review* (22 January 2018); David S. McDonough, "The Evolution of American Nuclear Strategy", *Adelphi Papers* 46, no. 383 (2006): 13—28. See further Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton, NJ: Princeton University Press, 1990).

25 The notion of escalation dominance and the metaphor of an "escalation ladder" go back to Herman Kahn, *On Esca-*

for escalation dominance is a "favourable asymmetry of capabilities", so that the burden of escalation is imposed on the other side.[26] In the 1970s, the resulting strategy was known as the "countervailing" strategy. The term is rarely used in the current debate any more, but the underlying logic is very much alive: The adversary has to be denied success at all levels of warfare. The aim is to deter, but the gap between deterrent threats in peace and war-fighting in the event of deterrence failure is to be kept as narrow as possible. This leads to the "conventionalisation" of nuclear warfare — the idea that "a nuclear war can be fought in a conventional way, that is, to conventionalise nuclear war in order to be able to come out of it alive".[27]

The current development of US nuclear policy follows this logic. This can be clearly seen in the debate about strengthening nuclear deterrence against Russia. The (military) threat to the eastern NATO states can — according to a widespread perception — occur in two ways: firstly, in a subversive, hybrid way, in which open military force is threatened by Russia, rather than actually used; and secondly, through the rapid occupation of territory in order to create facts before NATO can react. In the latter case, NATO would be faced with the choice of engaging in war or accepting the territorial loss.[28]

It is feared that, during the course of a conventional war, Russia could escalate to the nuclear level in order to force an end to the war before the United States and other NATO members are able to deploy superior conventional forces.[29] On the NATO side, under the conditions of the East-West conflict, this was an option under the flexible response strategy in order to demonstrate to the Soviet Union that any conventional attack carried an incalculable risk. There is much speculation about Russia's strategy of "escalate to de-escalate". Official Russian military doctrine remains silent about where the threshold for using of nuclear weapons actually lies — with the exception of the hint that nuclear weapons would be used if the existence of the state were threatened. A certain ambiguity is also considered useful on the Russian side.[30]

Should Russia use tactical nuclear weapons with relatively low yields, it is feared that NATO would have no credible options: Airplanes with gravity bombs would hardly overcome Russian air defences. Only in a massive military conflict — in which Russian air defence systems would already be decisively weakened — would it make sense to use nuclear bombers from bases in Western Europe; everything else would probably be nothing more than a "suicide mission".[31]

If the use of presently available tactical nuclear weapons is seen as being militarily incredible, there remain only US strategic nuclear weapons, whose early use would be politically incredible. The lack of credible options could mean that NATO would be forced to end the war rather than risk a massive nuclear exchange should Russia resort to using a few tactical nuclear weapons.[32] Thus, to make clear to

lation: Metaphors and Scenarios (New York, NY: Praeger, 1965), 290.

26 Lawrence Freedman, *The Evolution of Nuclear Strategy* (London and New York, NY: Palgrave Macmillan, third edition, 2003), 206.

27 Hans J. Morgenthau, "The Fallacy of Thinking Conventionally about Nuclear Weapons", in *Arms Control and Technological Innovation*, ed. David Carlton and Carlo Schaerf (London: Croom Helm, 1977), 255—64 (256 and 258).

28 See, e.g., Martin Zapfe, "Deterrence from the Ground Up: Understanding NATO's Enhanced Forward Presence", *Survival* 59, no. 3 (June—July 2017): 147—60.

29 See Elbridge Colby, *The Role of Nuclear Weapons in the U.S.-Russian Relationship*, Task Force White Paper (Carnegie Endowment for International Peace, Task Force on U.S. Policy toward Russia, Ukraine, and Eurasia Project, 26 February 2016); on Russian nuclear doctrine, see Olga Oliker, *Russia's Nuclear Doctrine: What We Know, What We Don't, and What That Means* (Washington, DC: Center for Strategic and International Studies, May 2016); Kristin Ven Bruusgaard, "The Myth of Russia's Lowered Nuclear Threshold", *War on the Rocks* (22 September 2017), https://warontherocks.com/2017/09/the-myth-of-russias-lowered-nuclear-threshold/ (accessed 2 May 2018).

30 See Anya Loukianova Fink, "The Evolving Russian Concept of Strategic Deterrence: Risks and Responses", *Arms Control Today* 47, no. 6 (July/August 2017): 14—20.

31 Edmond Seay, "NATO's Incredible Nuclear Strategy: Why U.S. Weapons in Europe Deter No One", *Arms Control Today* 41, no. 9 (November 2011): 8—11; Steve Andreasen, "Rethinking NATO's Tactical Nuclear Weapons", *Survival* 59, no. 5 (October—November 2017): 47—53.

32 See Jüri Luik and Tomas Jermalavicius, "A Plausible Scenario of Nuclear War in Europe, and How to Deter It: A Perspective from Estonia", *Bulletin of the Atomic Scientists* 73, no. 4 (2017): 233—39. "Currently, the United States and NATO do not have an obvious and credible response to a limited Russian nuclear strike. Such a capability is required, not so that NATO can fight a nuclear war, but rather to demonstrate that NATO has a credible response to any feasible scenario in order to deter Russia from conducting

Russia that winning a war by escalating will not work, the US needs discriminate nuclear options that can be credibly threatened and executed. At least this is the case if one follows the traditional logic of US nuclear strategy.[33]

It is therefore not without reason that the old metaphor of the "rungs on the escalation ladder" is back in vogue. The credibility of deterrence is seen in having nuclear options for all conceivable scenarios, options that are proportional to the options of the potential adversary. In the logic of such thinking, the deficit of non-strategic nuclear weapons in Europe becomes a severe problem, since Russia has a comparatively large number of non-strategic nuclear weapons and, according to US estimates, is developing low-yield, tactical nuclear weapons.[34]

The United States needs the capacity for a "limited nuclear war".

From this point of view, the United States needs the capacity for a "limited nuclear war".[35] Should there be a military conflict with Russia in Eastern Europe or with China in the Pacific in which no vital interests of the United States are at stake, then this war must be fought in a way that all-out nuclear war would be avoided and, at the same time, the political purpose can be achieved. This means that in a "competition in brinkmanship", the United States must have the capabilities and the resolve to impose the burden of further escalation on the other side.[36] This view is reflected in the 2018 NPR, which, among other things, serves to influence the perceptions of potential adversaries. They should come to the conclusion that they cannot benefit from a limited nuclear escalation.[37] The United States therefore needs a wider range of graduated nuclear options, in particular relatively low-yield nuclear weapons, in order to reduce the credibility problem that is inherent to the use of strategic nuclear weapons against an opponent capable of nuclear counterstrikes.

Following this logic, low-yield nuclear weapons gain importance in a strategy aimed at escalation control. The modernised B61 Model 12 gravity bombs, which, according to American plans, are to replace the old bombs stored in Europe from 2021 onwards, have a mechanism to reduce the yield to about two per cent of the destructive power of the Hiroshima bomb. Some variants of the existing B61 bomb are already equipped with such a mechanism. However, the modernised B61 bomb is more accurate and capable of eliminating hardened targets.[38] It is thus suitable as a first step in the process of nuclear escalation. From the Russian perspective, it is a cause for concern that a new generation of stealth aircraft, including the F-35 Lightning 2, could deliver these bombs from bases of NATO member states in eastern Europe.[39] In addition, as announced in the 2018 NPR, new low-yield, sea-launched cruise missiles will be developed and submarine-based ballistic missiles equipped with low-yield nuclear warheads.

a nuclear attack in the first place." Matthew Kroenig, *Toward a More Flexible NATO Nuclear Posture: Developing a Response to Russian Nuclear De-escalation Strike* (Washington, DC: Atlantic Council, November 2016), 5.

33 See Keir A. Lieber and Daryl G. Press, *Coercive Nuclear Campaigns in the 21st Century* (Monterey, CA: Naval Postgraduate School, The Center on Contemporary Conflict, March 2013); Clark Murdock, Samuel J. Brannen, Thomas Karako and Angela Weaver, *Project Atom: A Competitive Strategies Approach to Defining U.S. Nuclear Strategy and Posture for 2025–2050*. A Report of the CSIS International Security Program (Lanham: Rowman & Littlefield, 2015), VI; Elbridge Colby, *A Nuclear Strategy and Posture for 2030* (Washington, DC: Center for a New American Security, October 2015).

34 See Michael Frankel, James Scouras and George Ullrich, *Nonstrategic Nuclear Weapons at an Inflection Point* (The Johns Hopkins University Applied Physics Laboratory, 2017). Estimates of the number of non-strategic nuclear warheads on the Russian side (including about 760 sea-based warheads) total about 2,000. See Hans M. Kristensen and Robert S. Norris, "Russian Nuclear Forces, 2017", *Bulletin of the Atomic Scientists* 73, no. 2 (2017): 115–26.

35 "Limited nuclear war is a conflict in which nuclear weapons are used in small numbers and in a constrained manner in pursuit of limited objectives (or are introduced by a country or non-state actor in the face of conventional defeat)." Jeffrey A. Larsen, "Limited War and the Advent of Nuclear Weapons", in *On Limited War in the 21st Century*, ed. Jeffrey A. Larsen and Kerry M. Kartchner (Stanford, CA: Stanford Security Studies, 2014), 3–20 (6, originally in italics).

36 Elbridge Colby, *Prevailing in Limited War* (Washington, DC: Center for a New American Security, August 2016), 26.

37 For more information, see Department of Defense, *Nuclear Posture Review* (see note 13), VII, 30–32.

38 See Hans M. Kristensen and Robert S. Norris, "The B61 Family of Nuclear Bombs", *Bulletin of the Atomic Scientists* 70, no. 3 (2014): 79–84.

39 See James E. Doyle, "Strategic Stability and Arms Control", *Adelphi Series* 56, no. 462 (2016): 49–68 (52–53).

The introduction of these weapon systems is intended to strengthen the credibility of deterrence and raise the nuclear threshold insofar as potential adversaries are deterred from engaging in a limited nuclear escalation. However, should a military conflict arise, one problem remains unsolved in this way of thinking: that of controlling nuclear escalation. With regard to the escalation dynamics, two problems appear. Firstly, if American nuclear weapons — even if considered tactical — are used against targets on Russian soil, then an extremely important threshold is crossed. Basically, one can assume that there are two central thresholds in the escalatory process:[40] the use of nuclear weapons at all, and then against targets on the territory of the nuclear antagonist. At the time of the East-West conflict, sensitivity to this second threshold was very much present in American deterrence thinking. At that time, nuclear attacks against Soviet military bases in Eastern Europe were an intermediate stage in the escalation logic. Today, such an option no longer exists. Secondly, Russian early warning systems cannot distinguish whether a ballistic missile fired by a US submarine is equipped with a warhead of enormous destructive power or with a low-yield warhead.[41]

Whether — and how — a nuclear war could be limited and ended was already a problem under the conditions of the East-West confrontation for which the protagonists of such a deterrence strategy had no convincing answer, except one: namely to have as many flexible options as possible.[42] This problem is reflected in the NPR, which says:

> Every U.S. administration over the past six decades has called for flexible and limited U.S. nuclear response options, in part to support the goal of reestablishing deterrence following its possible failure. This is not because reestablishing deterrence is certain, but because it may be achievable in some cases and contribute to limiting damage, to the extent feasible, to the United States, allies, and partners.[43]

In order to demonstrate the credibility of extended nuclear deterrence and to limit the damage in the event of deterrence failure, deterrence logic also requires the capacity for pre-emptive counterforce options. These were part of US deterrence policy during the East-West conflict.[44] Limiting damage by eliminating the adversary's strategic nuclear potential played an important role in the thinking of American decision-makers; in public announcements, however, mentioning damage limitation through a first strike was more or less taboo.[45] Pre-emptive options have remained part of nuclear deterrence policy; a draft document on the doctrine for joint nuclear operations openly referred to these options in 2005:

> Deterrence of potential adversary WMD [weapons of mass destruction] use requires the potential adversary leadership to believe the US has both the ability and will to preempt or retaliate promptly with responses that are credible and effective.[46]

Options to neutralise enemy nuclear weapons span wide areas of warfare. They range from more precise, low-yield nuclear weapons, whose detonation above the "fallout threshold" does not release radioactive fallout to the same extent as ground bursts, to cyber and anti-submarine warfare, missile defence, and precision-guided, long-range conventional weapons

40 The significance of "thresholds" depends on the subjective perceptions of the participants, thus leaving room for much speculation. See Forrest E. Morgan, Karl P. Mueller, Evans S. Medeiros, Kevin L. Pollpeter and Roger Cliff, *Dangerous Thresholds: Managing Escalation in the 21st Century* (Santa Monica, CA: RAND Corporation, 2008), 8—11.

41 See Vipin Narang, "The Discrimination Problem: Why Putting Low-yield Nuclear Weapons on Submarines Is So Dangerous", *War on the Rocks* (2 February 2018), https://warontherocks.com/2018/02/discrimination-problem-putting-low-yield-nuclear-weapons-submarines-dangerous/ (accessed 2 May 2018).

42 See Jervis, *The Illogic of American Nuclear Strategy* (see note 6), 56—85.

43 Department of Defense, *Nuclear Posture Review* (see note 13), 23.

44 See Austin Long, *Deterrence from Cold War to Long War: Lessons from Six Decades of RAND Research* (Santa Monica, CA: RAND Corporation, 2008), 25—43 (quote on p. 27).

45 Brendan Rittenhouse Green and Austin Long, "The Geopolitical Origins of US Hard-target-kill Counterforce Capabilities and MIRVs", in Michael Krepon, Travis Wheeler and Shane Mason, *The Lure and Pitfalls of MIRVs: From the First to the Second Nuclear Age* (Washington, DC: Stimson Center, May 2016), 19—53 (43).

46 Joint Chiefs of Staff, *Doctrine for Joint Nuclear Operations,* 2005 (see note 17), I—6. The remarks on preemption led to some criticism in Congress; the document was later "cancelled". See "Pentagon Cancels Controversial Nuclear Doctrine", *Nuclear Brief*, February 2006, http://www.nukestrat.com/us/jcs/canceled.htm (accessed 2 May 2018).

— all in conjunction with increased information processing and remote sensing. These capabilities are not — or will not be — limited to the United States, but it is leading the way in what has been called the "Counterforce Revolution".[47]

47 See Keir A. Lieber and Daryl G. Press, "The New Era of Nuclear Weapons, Deterrence, and Conflict", *Strategic Studies Quarterly* (Spring 2013), 3—14; Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence", *International Security* 41, no. 4 (Spring 2017): 9—49. See also Hans M. Kristensen, Matthew McKinzie and Theodore A. Postol, "How US Nuclear Force Modernization Is Undermining Strategic Stability: The Burst-height Compensating Super-fuze", *Bulletin of the Atomic Scientists*, 1 March 2017, https://thebulletin.org/how-us-nuclear-force-modernization-undermining-strategic-stability-burst-height-compensating-super10578 (accessed 2 May 2018).

The Legal Dimension: Approaches to Legitimising Nuclear Deterrence and Their Problems

According to the official US view as it has emerged over the last two decades, the basic norms of international humanitarian law (distinction, proportionality, and military necessity) apply to the use of nuclear weapons.[48] However, this was not always the case. Over the course of the Cold War, such considerations did not play a significant role. Whether in the context of the strategy of "massive retaliation" or later in the concept of "assured destruction", deterrence was ultimately based on the threat to destroy the enemy's society, even if it was occasionally declared that the Soviet population was not targeted "as such".[49] "Assured-destruction capability" — according to the classic formulation of then-Secretary of Defense Robert McNamara in 1967 — consisted of being able to inflict "unacceptable damage" on the enemy even after absorbing an enemy first strike, damage to the extent that the enemy society "would be simply no longer viable in twentieth-century terms. That is what deterrence of nuclear aggression means. It means the certainty of suicide to the aggressor, not merely to his military forces, but to his society as a whole."[50]

This implied: destruction of at least 30 per cent of the population, 50 per cent of industrial capacity, and 150 cities.[51] In such an understanding of deterrence, there was no room for international humanitarian law. This only changed after the East-West conflict, primarily because the US, like other states, had to present its position before the International Court of Justice in the mid-1990s. The UN General Assembly had asked the Court for an advisory opinion on whether, under international law, the threat or use of nuclear weapons was permitted under all circumstances.[52]

Nuclear weapons are seen as conventional weapons with greater explosive power.

From the American point of view presented to the Court, nuclear weapons are not seen as weapons with unique characteristics, but rather as conventional weapons with greater explosive power.[53] It is denied

48 See Department of Defense, Office of General Counsel, *Department of Defense Law of War Manual* (June 2015, updated December 2016), 416–18, https://www.hsdl.org/?view&did=797480 (accessed 2 May 2018).

49 See Charles H. Builder and Morlie H. Graubard, *The International Law of Armed Conflict: Implications for the Concept of Assured Destruction* (Santa Monica, CA: RAND Corporation, January 1982).

50 "Mutual Deterrence", Speech by Secretary of Defense Robert McNamara (San Francisco, 18 September 1967), http://www.atomicarchive.com/Docs/Deterrence/Deterrence.shtml (accessed 2 May 2018).

51 See Schlosser, *Command and Control* (see note 22), 302.

52 See Theodore T. Richard, "Nuclear Weapons Targeting: The Evolution of Law and U.S. Policy", *Military Law Review* 224, no. 4 (2016): 862–978 (947–49).

53 On this and the following, see *United States Department of State*, letter dated 20 June 1995 from the acting legal adviser to the Department of States, together with written statement of the government of the United States of America (before the International Court of Justice), https://www.icj-cij.org/files/case-related/95/8700.pdf (accessed 2 May 2018). For a critical perspective, see Dean Granoff and Jonathan Granoff, "International Humanitarian Law and Nuclear Weapons:

that the use of nuclear weapons has an inherently indiscriminate effect. The assumption that any use of nuclear weapons will lead to a strategic nuclear war in which population centres will be destroyed is considered an extreme speculation and cannot be the basis for a legal assessment. The precise use of low-yield nuclear weapons against military targets can satisfy the principle of distinction. It is conceded that the use of nuclear weapons has an impact on human health and the environment; however, as it is argued, this is also the case in conventional wars. If the use of nuclear weapons were fundamentally contrary to international humanitarian law, and if there were no possibility for the legal use of nuclear weapons, the system of nuclear deterrence could hardly be legally defended. That the legality of nuclear deterrence depends on the legality of the use of nuclear weapons was not questioned in the US statement before the Court. The United States — in its self-image a law-abiding nation — must claim legal justification for the possible use of nuclear weapons; otherwise this would undermine the credibility of the deterrent threat.[54]

Another justification under customary international law rests upon the use of nuclear weapons as a reprisal against the use of nuclear weapons by another state. Reprisals must be implemented with the intention of putting an end to violations of the law of armed conflict by the other party after all other means have been exhausted. Furthermore, reprisals must be proportional to the unlawful conduct of the other party. According to the American view, it depends on the individual case as to how reprisals are to be assessed legally. The First Additional Protocol to the Geneva Conventions (1977) prohibits attacks against civilians as reprisal, but the United States, like many other states, recognises the provisions of the Additional Protocol only with regard to the use of conventional weapons (the United States has not ratified the Protocol; France, the United Kingdom, and some other NATO member states have done so only with the aforementioned reservation).[55]

Nuclear planners in the United States have declared their efforts to use nuclear weapons in a manner that complies with international war law, in particular the principle of distinction and proportionality.[56] However, legitimate military objects are understood in a very broad sense and "loopholes" are created, so that even military operations with millions of "collateral" victims among the civilian population can be interpreted as being consistent with international humanitarian law.[57] According to the Department of Defense Law of War Manual, "war-sustaining" and not only "war-supporting" objects are considered legitimate targets, including such objects that could be used later for military purposes:

> Military action has a broad meaning and is understood to mean the general prosecution of the war. It is not necessary that the object provide immediate tactical or operational gains or that the object make an effective contribution to a specific military operation. Rather, the object's effective contribution to the war-fighting or war-sustaining capability of an opposing force is sufficient. Although terms such as "war-fighting", "war-supporting", and "war-sustaining" are not explicitly reflected in the treaty definitions of military objective, the United States has interpreted the military objective definition to include these concepts.[58]

Irreconcilable Differences", *Bulletin of the Atomic Scientists* 67, no. 6 (2011): 53—62.

54 "Law-abiding States committed to nuclear deterrence as a means to international stability must maintain the position that nuclear weapon use is ultimately permitted by the law of war, or their deterrence policies will forsake credibility." Lt. Col. Ted Richard and Sean Watts, "The International Legal Environment for Nuclear Deterrence", *justsecurity.org* (27 March 2017), https://www.justsecurity.org/39281/international-legal-environment-nuclear-deterrence/ (accessed 2 May 2018).

55 On this and the legal aspects, see Charles J. Moxley, Jr., John Burroughs and Jonathan Granoff, "Nuclear Weapons and Compliance with International Humanitarian Law and the Non-proliferation Treaty", *Fordham International Law Journal* 34, no. 4 (2011): 594—696.

56 As the Employment Guidance 2013 states: "The new guidance makes clear that all plans must also be consistent with the fundamental principles of the Law of Armed Conflict. Accordingly, plans will, for example, apply the principles of distinction and proportionality and seek to minimize collateral damage to civilian populations and civilian objects. The United States will not intentionally target civilian populations or civilian objects." Department of Defense, *Report on Nuclear Employment Strategy* (see note 12), 4—5.

57 On this and the following, see Jeffrey G. Lewis and Scott D. Sagan, "The Nuclear Necessity Principle: Making U.S. Targeting Policy Conform with Ethics & the Laws of War", *Daedalus* 145, no. 4 (Autumn 2016): 62—74.

58 Department of Defense, *Department of Defense Law of War Manual* (see note 48), 214.

This is a much broader and controversial interpretation of an effective contribution to military action than the wording of the First Additional Protocol to the Geneva Convention suggests (Article 52): If the nature of the object, its location, and its purpose make an effective contribution to military actions, and a definite military advantage can be expected from its destruction or neutralisation under the given circumstances, then this is a military object.

Even if protected objects must not be attacked intentionally, there are exceptions to this rule, according to the joint targeting manual of the Joint Chiefs of Staff of 2013:

> Civilian populations and civilian/protected objects may not be intentionally targeted, although there are exceptions to this rule. Civilian objects consist of all civilian property and activities other than those used to support or sustain warfighting capability. Acts of violence solely intended to spread fear among the civilian population are prohibited.[59]

In summary, the legal defence for the use of nuclear weapons has two elements that, together, expand the universe of legitimate goals to such an extent that counterforce attacks with a high number of civilian victims become legally unproblematic. As long as very broadly defined military objects are attacked and the death of civilians is not intended — but a side effect, albeit a foreseeable one — everything seems possible. This, by the way, was the line of argument used to legally justify massive area bombardments and the destruction of entire cities during the Second World War and, in particular, during the Korean War.[60]

Legitimising the use of nuclear weapons focusses on targeted strikes of low-yield nuclear weapons.

The attempt to construct the possibility for a legally permissible use of nuclear weapons focusses on singular strikes with low-yield nuclear weapons directed against military targets. However, it is questionable whether even such a limited use is consistent with international humanitarian law, since the consequences from radioactive fallout and radiation cannot be contained. In addition, this way of defending the use of nuclear weapons completely ignores the cumulative effects of many "smaller" nuclear strikes.[61]

Certainly, damage estimates for nuclear war scenarios should be viewed with scepticism. But they give an idea of what a massive use of nuclear weapons could mean for the civilian population — even if it were only directed against Russian nuclear weapons and their infrastructure (including C3 facilities). A calculation based on the use of 1,300 American warheads concludes that eight to twelve million people would die among the Russian population, and several millions more would be injured. Even the most precise attacks against military targets would inevitably lead to high numbers of casualties among civilians, not least because of the radioactive fallout.[62]

In addition, there are the climatic consequences resulting from nuclear war. In the 1980s, the discussion was conducted under the heading "nuclear winter"; it broke off when the East-West conflict came to an end. With the reduction in the number of warheads — and, on average, also their yields — the scenario of a thermonuclear war, in which the United States and the Soviet Union would use nuclear arsenals the size of 5,000 megatons, lost plausibility and political relevance. The debate has only got under way again over the last 10 years and is now based on

59 Joint Chiefs of Staff, *Joint Targeting*, Joint Publication 3—60 (31 January 2013), A—2, https://www.justsecurity.org/wp-content/uploads/2015/06/Joint_Chiefs-Joint_Targeting_20130131.pdf (accessed 2 May 2018).

60 On this, see Sahr Conway-Lanz, "Bombing Civilians after World War II: The Persistence of Norms against Targeting Civilians in the Korean War", in *The American Way of Bombing: Changing Ethical and Legal Norms, from Flying Fortresses to Drones*, ed. Matthew Evangelista and Henry Shue (Ithaca, NY: Cornell University Press, 2014), 47—63.

61 Even if the attacks directed against military targets are far from population centres, it was argued that the following principle should be applied: "… a presumption of illegality with regard to the use of such weapons outside populated areas". Louis Maresca and Eleanor Mitchell, "The Human Costs and Legal Consequences of Nuclear Weapons under International Humanitarian Law", *International Review of the Red Cross* 97, no. 899 (2015): 621—45 (645).

62 Matthew G. McKinzie, Thomas B. Cochran, Robert S. Norris and William M. Arkin, *The U.S. Nuclear War Plan: A Time for Change* (New York, NY: Natural Resources Defense Council, June 2001).

climate models developed to assess global warming. It must be assumed that even a "limited" regional nuclear war, for example between India and Pakistan, in which 50 warheads the size of the Hiroshima bomb would be used, could have catastrophic consequences for the climate, and thus also for food production. This might expose two billion people to the risk of starvation. To a large extent, the environmental effects of nuclear weapons depend on the degree to which the detonations lead to fires — and hence pollute the atmosphere, and ultimately the stratosphere, with smoke and soot absorbing the solar radiation. This would lead to a warming of the stratosphere and possibly to massive damage to the ozone layer as a result of increased UV radiation. But the most devastating effects would result from the cooling of the Earth's surface, namely reduced plant growth and crop yields.[63]

Although this discussion has been reflected since 2007 in scientific journals and at international conferences on the humanitarian consequences of nuclear weapons use, it has been largely ignored by US politicians, the Department of Defense, and the Department of Energy. The "nuclear winter" theory is apparently deemed to be obsolete, if today's nuclear planners even know about it at all.[64] Atmospheric consequences of nuclear weapon detonations are not taken into account in their calculations. Not only in this respect is there considerable uncertainty about the harmful physical consequences of the explosions of nuclear weapons, as even scientists who are not opposed to nuclear deterrence admit.[65]

63 See Seth D. Baum, "Winter-safe Deterrence: The Risk of Nuclear Winter and Its Challenge to Deterrence", *Contemporary Security Policy* 36, no. 1 (2015): 123—48; furthermore, Alan Robock and Owen Brian Toon, "Self-assured Destruction: The Climate Impacts of Nuclear War", *Bulletin of the Atomic Scientists* 68, no. 2 (2012): 66—74; Ira Helfand, *Nuclear Famine: Two Billion People at Risk? Global Impacts of Limited Nuclear War on Agriculture, Food Supplies, and Human Nutrition* (International Physicians for the Prevention of Nuclear War/Physicians for Social Responsibility, November 2013).

64 See Steven Starr, "Turning a Blind Eye towards Armageddon — U.S. Leaders Reject Nuclear Winter Studies" (9 January 2017); https://fas.org/2017/01/turning-a-blind-eye-towards-armageddon-u-s-leaders-reject-nuclear-winter-studies/ (accessed 2 May 2018); Alan Robock, "Nuclear Winter Is a Real and Present Danger", *Nature* 473 (19 May 2011): 275—76.

65 See Michael Frankel, James Scouras and George Ullrich, *The Uncertain Consequences of Nuclear Weapons Use* (The Johns Hopkins University Applied Physics Laboratory, 2015), 8—9, 37.

The Ethical Dimension: Approaches to Justifying Nuclear Deterrence and Their Contradictions

Nuclear deterrence is not only confronted with problems under international humanitarian law, but also with the fundamental problem of how to justify it morally. Intended as an instrument to prevent the use of force, deterrence is based on the contingent intention of using force to an extent that cannot be justified (or only under narrow hypothetical conditions) according to the *jus in bello* criteria, which play a central role not only in international humanitarian law, but also in ethical discussions. The objection is that the deterrent threat is ultimately based on inflicting serious harm on innocent people without their consent, taking them as hostages, and therefore degrading them to a mere means.[66]

Counterforce strategies are propagated as a way out of the moral dilemma posed by nuclear deterrence.

If nuclear weapons are (can be) used in such a way that non-combatants are not attacked intentionally and the population is not taken hostage, then — it seems — the fundamental objection against nuclear deterrence loses its validity. However, it can be argued that the use of nuclear weapons solely against military targets cannot be effective in terms of deterrence. If one renounces the option of escalating up to the destruction of enemy cities, one deprives oneself of the possibility to prevent the enemy from escalating to this level during a war (in the sense of intra-war deterrence), and thus to limit the war. This is precisely one of the expectations attached to a deterrent based upon a countervailing approach, as then-Secretary of Defense Harold Brown made clear in 1979: "[I]t is essential at all times to retain the option to attack urban-industrial targets — both as a deterrent to attacks on our own cities and as the final retaliation if that particular deterrent should fail."[67]

Anyone who wants to invalidate these fundamental moral objections to nuclear deterrence would have to plausibly prove, on the one hand, that the principles of distinction and proportionality will not be violated within the framework of a counterforce strategy, and that a nuclear war can be limited. On the other hand, convincing arguments must be made that the threat to eventually use nuclear force on a massive — and hence immoral — scale would not be immoral in itself.[68]

Occasionally, it has been argued in ethical debates that the use of nuclear weapons is not intentionally aimed at killing non-combatants. But one can object that the strategic purpose of deterrence is to threaten unacceptable damage, which always implicitly in-

66 In detail on these questions, see Steven P. Lee, *Morality, Prudence, and Nuclear Weapons* (Cambridge: Cambridge University Press, 1993), 35–81.

67 Quote in: Daniel J. Arbess and Simeon A. Sahaydachny, "Nuclear Deterrence and International Law: Some Steps toward Observance", *Alternatives* 12 (1987): 83–111 (90); on the problem, see Lee, *Morality, Prudence, and Nuclear Weapons* (see note 66), 166–75.

68 Rejecting these arguments, see C. A. J. Coady, "Escaping from the Bomb: Immoral Deterrence and the Problem of Extrication", in *Nuclear Deterrence and Moral Restraint: Critical Choices for American Strategy*, ed. Henry Shue (Cambridge: Cambridge University Press, 1989), 163–225.

cludes losses among the civilian population. From this perspective, intentionality is causally determined by strategic purpose — not by the fact of whether the missiles are directly aimed at civilians, but whether harm to non-combatants is accepted as expedient.[69]

Apologists of nuclear deterrence offer contradictory arguments when they engage in ethical debates: While denying the unique character of nuclear weapons and claiming that it is possible to use them in a morally and legally legitimate way, they also postulate the superiority of nuclear deterrence over conventional deterrence — because the former is ultimately based on the risk of uncontrollable escalation and, consequently, unacceptably high costs.[70]

However, as some advocates of nuclear deterrence based on credible warfighting options have pointed out, the position that emerged in the churches during public nuclear ethics debates in the early 1980s suffers from its own incoherence.[71] Under the conditions of the East-West conflict, the Catholic Church and some mainline Protestant churches adopted the position that nuclear deterrence was acceptable for a limited time as an instrument of war prevention, but that it had to be overcome in the long term because of its risks and costs.[72] Interim ethical positions have assumed that it is possible to separate the deterrent threat from the actual use of nuclear weapons. Nuclear threats with the sole aim of preventing war were considered (conditionally) acceptable; however, the actual use of nuclear weapons was (almost always) prohibited because it would not comply with the principles of distinction and proportionality.

Nuclear interim ethic has passed its "expiration date".

The conditioned toleration of nuclear deterrence was clearly expressed in the Pastoral Letter of the United States Conference of Catholic Bishops — written in 1983 against the background of fierce controversies over nuclear arms. The conditions for the interim acceptance of nuclear deterrence included, in particular, the renunciation of nuclear supremacy, the orientation towards war prevention and stability, and compatibility with disarmament. With the end of the East-West conflict, the political conditions under which nuclear deterrence was regarded as acceptable ceased to exist, namely a perceived threat from a totalitarian Soviet regime. As a reaction to the inertia of the nuclear deterrence system, at least in the Vatican's statements there is a clear shift away from interim ethics.[73] Some statements suggest the interpretation that the Holy See has adopted a nuclear-pacifist position — especially as illustrated by Pope Francis's statement in November 2017 that the threat of using nuclear weapons, as well as their very possession, is to be firmly condemned.[74] Nuclear interim ethic, as formulated at the beginning of the 1980s, has passed its "expiration date".[75]

Of course, one can completely break away from the *bellum-justum* tradition and evaluate nuclear deter-

69 See John Finnis, Joseph Boyle and Germain Grisez, *Nuclear Deterrence, Morality and Realism* (Oxford: Clarendon Press, 1987), 92—94.

70 On this contradiction, see Lothar Waas, "Ethische Theorien und nukleare Abschreckungsstrategie: Möglichkeiten und Grenzen der moralischen Beurteilung", in: *Nukleare Abschreckung — Politische und ethische Interpretationen einer neuen Realität*, ed. Uwe Nerlich and Trutz Rendtorff, in collaboration with Lothar Waas, Internationale Politik und Sicherheit, vol. 25 (Baden-Baden: Nomos Verlagsgesellschaft, 1989), 655—88 (666).

71 See Michael Quinlan, "The Ethics of Nuclear Deterrence: A Critical Comment on the Pastoral Letter of the U.S. Catholic Bishops", *Theological Studies* 48 (1987): 3—24.

72 As an overview, see Stephen R. Rock, "From Just War to Nuclear Pacifism: The Evolution of U.S. Christian Thinking about War in the Nuclear Age, 1946—1989", *Social Sciences* 7, no. 6 (2018), https://doi.org/10.3390/socsci7060082; in addition, see Emmanuelle Maître, *Is Nuclear Deterrence Morally Defensible? Religious Perspectives* (Paris: Fondation pour la Recherche Stratégique, November 2016).

73 See Paolo Foradori, "The Moral Dimension of 'Global Zero': The Evolution of the Catholic Church's Nuclear Ethics in a Changing World", *Nonproliferation Review* 21, no. 2 (2014): 189—205; in addition, see Gregory M. Reichberg, "The Morality of Nuclear Deterrence: A Reassessment", in *Nuclear Deterrence: An Ethical Perspective*, ed. Matthias Nebel and Gregory M. Reichberg (Chambésy: The Caritas in Veritate Foundation, 2015), 9—31.

74 Address of His Holiness Pope Francis to participants in the international symposium "Prospects for a World Free of Nuclear Weapons and for Integral Disarmament" (10 November 2017), https://w2.vatican.va/content/francesco/en/speeches/2017/november/documents/papa-francesco_20171110_convegno-disarmointegrale.html (accessed 13 August 2018).

75 Laurie Johnston, "Nuclear Deterrence: When an Interim Ethic Reaches Its Expiration Date", *Political Theology Today*, 9 May 2014, https://politicaltheology.com/nuclear-deterrence-when-an-interim-ethic-reaches-its-expiration-date/ (accessed 2 May 2018). In addition, see Gerard Powers, "Papal Condemnation of Nuclear Deterrence and What Is Next", *Arms Control Today* 48, no. 4 (May 2018): 6—11.

rence purely in terms of consequentialist ethics. From this perspective, it is pivotal as to whether nuclear deterrence prevents more harm than a renunciation of deterrence.[76] However, such impact assessments are subject to great uncertainty. As the ethical debates on nuclear deterrence at the time of the East-West confrontation showed, any probability estimates of this kind are based on highly speculative empirical assumptions.[77]

Since traditional ethical approaches to the evaluation of nuclear deterrence lead to aporias,[78] the idea of interpreting nuclear deterrence as a genuine ethical theory of war prevention aimed at "eliminating war as a political option" was brought into play a few decades ago — still under the conditions of the fading East-West conflict.[79] This justification presupposes that nuclear deterrence resulting from the anticipated possibility of mutual destruction can permanently prevent war and eliminate military options as a means of policy between nuclear powers. But the real development of deterrence policy, at least on the US side, tends to undermine the basis of the postulated peace-preserving effect. Nuclear deterrence policy inevitably has to reckon with its failure and, accordingly, look for offensive, damage-limiting options, either because in the long run the adversary may not be the rationally calculating actor presupposed in the deterrence scenario, or because in a crisis he seeks, quite rationally, to exploit the mutual interest of avoiding atomic destruction to his own advantage. Attempts to reconstruct nuclear deterrence as an ethical theory of war prevention fail because of the actual development of nuclear deterrence policy.

76 See, e.g., Dieter Birnbacher, "Das moralische Dilemma der nuklearen Abschreckung", in *Analyse & Kritik* 9 (1987): 175—92. On consequentialist arguments for and against nuclear deterrence, see Joseph S. Nye, Jr., "Konsequentialistische Ethik und nukleare Abschreckung", in *Nukleare Abschreckung*, ed. Nerlich and Rendtorff (see note 70), 635—54.

77 Waas, "Ethische Theorien und nukleare Abschreckungsstrategien", in *Nukleare Abschreckung*, ed. Nerlich and Rendtorff (see note 70), 669.

78 See Trutz Rendtorff, "Überlegungen zur ethischen Interpretation der nuklearen Abschreckung", in *Nukleare Abschreckung*, ed. Nerlich and Rendtorff (see note 70), 715—30.

79 Uwe Nerlich and Trutz Rendtorff, "Die Zukunft der nuklearen Abschreckung. Einige Folgerungen für Theorie und Praxis", in *Nukleare Abschreckung*, ed. Nerlich and Rendtorff (see note 70), 851—64 (863).

The Political Dimension: Risks and Costs of the Deterrence System

The often-heard notion of "nuclear peace" is nothing more than a speculative hypothesis, proponents of which claim that nuclear deterrence secured peace between the East and West for decades, and therefore nuclear deterrence will continue to guarantee the absence of war between nuclear-armed states or alliances. But the absence of a war between the then-superpowers — the United States and the Soviet Union — can also be explained by the fact that the territorial division of the European continent had created such a degree of mutual security that a change in the balance of power would not have brought any corresponding benefits compared to the costs of a new, large-scale conventional war.[80] However, this explanation is also nothing more than a counterfactual speculation.

What can be said with certainty, however, is that an armed conflict between nuclear powers is by no means excluded. This was demonstrated, on the one hand, by the Sino-Soviet border conflict in 1969 and, on the other hand, by the Kargil War between India and Pakistan in 1999.[81] In the latter case, we can speak of war according to the criterion used in war studies, namely of more than 1,000 battle-related deaths over the course of one year. Pakistan began this war over the Kashmir region, obviously in the expectation that, under conditions of mutual nuclear deterrence, it could quickly decide a limited conventional war in its own favour, whereas India would shy away from a larger conventional war with its inherent risk of nuclear escalation. In academic research, this war is interpreted in light of the so-called stability—instability paradox. Stability at the nuclear strategic level can lead one side to use limited force in the expectation that the other side will react cautiously in order to avoid nuclear war.[82]

Looking back, one may speak of luck that there was no use of nuclear weapons between the United States/NATO and the Soviet Union due to miscalculations and errors.[83] According to another interpretation, it was not luck, but rather the interaction of human prudence and functioning control systems that prevented the use of nuclear weapons. Even in the case of the Cuban Missile Crisis, when the use of nuclear weapons might have been most likely, it is argued that the launch of a Soviet nuclear torpedo would not necessarily have meant an escalation to a thermonuclear war.[84] Whether luck or prudence, the system of deterrence was by no means as stable as the talk of a "balance of terror" through "mutual

80 See John D. Orme, "The War That Never Happened: Structure, Statesmanship, and the Origins of the Long Peace", *Security Studies* 10, no. 4 (Summer 2001): 117—42.

81 For the Soviet-Chinese border conflict no reliable loss figures are available. For more information on this conflict, see Michael S. Gerson, *The Sino-Soviet Border Conflict: Deterrence, Escalation, and the Threat of Nuclear War in 1969* (Alexandria, VA: Center for Naval Analyses, November 2010).

82 See Benoit Pelopidas, "A Bet Portrayed As a Certainty: Reassessing the Added Deterrent Value of Nuclear Weapons", in *The War That Must Never Be Fought: Dilemmas of Nuclear Deterrence*, ed. George P. Shultz and James E. Goodby (Stanford, CA: Hoover Institution Press, 2015), 5—55 (11—13); Christopher J. Watterson, "Competing Interpretations of the Stability-instability-paradox: The Case of the Kargil War", *The Nonproliferation Review* 24, no. 1—2 (2017): 83—99.

83 See Patricia Lewis, Heather Williams, Benoit Pelopidas and Sasan Aghlani, *Too Close for Comfort: Cases of Near Nuclear Use and Options for Policy* (London: The Royal Institute for International Affairs, 2014).

84 Bruno Tertrais, "'On the Brink' — Really? Revisiting Nuclear Close Calls since 1945", *The Washington Quarterly* 40, no. 2 (2017): 51—66.

assured destruction" suggests. Both sides feared that, in an escalating crisis, the other side might resort to a pre-emptive first strike.[85]

Even after the Cuban Missile Crisis, the nuclear deterrent relationship between the United States and the Soviet Union was by no means as stable as the thesis of the "long peace" conveys. As became apparent in the autumn of 1983, a misjudgment of the opponent's capabilities and intentions and a lack of sensitivity to the other side's threat perception can lead to a potentially dangerous situation. The American countervailing strategy of the late 1970s — with its focus on decapitation attacks against the Soviet leadership and command facilities, loose talk about winning a nuclear war, and the planned and subsequent deployment of intermediate-range nuclear weapons in Europe — fuelled fear on the Soviet side that the United States might have a nuclear first-strike in mind. The Soviet leadership was concerned about the vulnerability of its nuclear forces.[86] Soviet early warning systems were in a precarious state, and the nuclear command-and-control systems were considered unreliable. In the view of Soviet intelligence services, which, like their US counterparts, tended to overestimate enemy capabilities, the United States had acquired the ability to destroy Soviet command centres by using nuclear weapons and new precision-guided conventional weapons. Fear of an American pre-emptive attack was prompted in November 1983, shortly before the deployment of medium-range nuclear missiles, when NATO conducted the nuclear exercise "Able Archer". But in the end, the Soviet leadership correctly assessed Western intentions and — apart from a few precautions, such as raising the alert level of its own forces — refrained from taking more far-reaching steps that could have led to a crisis.[87] There is some controversy about whether the Soviets really feared an American attack and how great the danger of nuclear escalation actually was at the time.[88] A long-classified retrospective assessment of the US president's Foreign Intelligence Advisory Board, written in 1990 and made public in 2015, concluded that the US intelligence services had misjudged the Soviet threat perception and had not taken the Soviet fear of an American pre-emptive strike seriously enough[89] — and had therefore provided the president with analyses that underestimated the risks for the United States: "In 1983 we may have inadvertently placed our relations with the Soviet Union on a hair trigger."[90]

The stability of the deterrence system cannot be taken for granted.

Due to technological developments, the problem of strategic stability may become more precarious today than at the time of the East-West conflict. In particular, progress in cyber warfare, but also developments in far-reaching conventional weapons, anti-satellite weapons, (American) missile defence, and autonomous weapon systems create the risk that, in an escalating crisis, second-strike capabilities might be seen as endangered, because the command, control, and communication systems could be vulnerable. Such fears are, it seems, more pronounced on the Russian than on the American side, but they are already being raised among US experts.[91] The stability of the deterrence system cannot be taken for granted.

85 See Bruce Blair, "Mad Fiction", *The Nonproliferation Review* 21, no. 2 (2014): 239–50.

86 See Brendan R. Green and Austin Long, "The MAD Who Wasn't There: Soviet Reactions to the Late Cold War Nuclear Balance", *Security Studies* 26, no. 4 (2017): 606–41.

87 See Dmitry (Dima) Adamsky, "The 1983 Nuclear Crisis — Lessons for Deterrence Theory and Practice", *Journal of Strategic Studies* 36, no. 1 (2013): 4–41. In detail and with reprints of numerous originally secret documents, see Nate Jones, *Able Archer 83: The Secret History of the NATO Exercise That Almost Triggered Nuclear War* (New York, NY, and London: The New Press, 2016).

88 See Klaas Voß, "Die Enden der Parabel. Die Nuklearwaffenübung 'Able Archer' im Krisenjahr 1983", *Mittelweg* 36, no. 6 (December 2014/January 2015): 73–92.

89 "We believe that the Soviets perceived that the correlation of forces had turned against the USSR, that the US was seeking military superiority, and that the chances of the US launching a nuclear first strike — perhaps under cover of a routine training exercise — were growing." President's Foreign Intelligence Advisory Board, *The Soviet "War Scare"* (15 February 1990), VII. The document, which was declassified in 2015, https://nsarchive2.gwu.edu//nukevault/ebb533-The-Able-Archer-War-Scare-Declassified-PFIAB-Report-Released/2012-0238-MR.pdf (accessed 2 May 2018); see also Benjamin B. Fischer, "Scolding Intelligence: The PFIAB Report on the Soviet War Scare", *International Journal of Intelligence and Counter Intelligence* 31, no. 1 (2018): 102–15.

90 President's Foreign Intelligence Advisory Board, *The Soviet "War Scare"* (see note 89), XII.

91 See James N. Miller and Richard Fontaine, *A New Era in U.S.-Russian Strategic Stability: How Changing Geopolitics and Emerging Technologies Are reshaping Pathways to Crisis and Conflict* (Cambridge, MA, and Washington, DC: Harvard Kennedy School, Belfer Center for Science and International Affairs/

As in the past, one has to expect that mutual nuclear deterrence feeds and cements an adversarial political relationship. In the system of deterrence, as developed under the conditions of the East-West conflict, the opponent was "condemned to be the eternal potential aggressor".[92] Whether he had the aggressive intentions attributed to him was irrelevant. His capabilities alone made him threatening. Threat assessments were conducted solely on the basis of enemy capabilities and apolitical worst-case scenarios, which presumed Soviet aggressiveness. Looking back at the years 1947–1953, when threat perceptions became entrenched, it is in no way obvious, or even plausible, that the Soviet Union was willing or able to conquer Western Europe.[93] As far as the available sources indicate, the argument that without nuclear deterrence the Soviet leadership would have attacked Western Europe lacks empirical evidence.[94]

In retrospect, one cannot demonstrate the existence of aggressive intentions of the Soviet Union and the Warsaw Pact against Western Europe. But the Soviet leadership's military planning was geared towards offensive warfare in the event of a war, which, in the Soviet threat perception, would have been initiated by the capitalist West. Never again should the Soviet Union become the victim of invasion and the scene of war; the war would be waged on the territory of the enemy and end victoriously with rapid offensive operations and the dismantling of NATO military forces. The United States and NATO, on the other hand, only aimed at restoring the territorial status quo ante in their military planning; at least this had been the case since the mid-1950s. The early military plans of NATO and the United States were aimed at defeating the Soviet Union and establishing a different regime, but the West moved away from this goal as the Soviet Union built up its nuclear arms.[95] According to an American analysis commissioned by the Pentagon in 1995 and based on interviews with former Soviet military officers and analysts, Soviet intentions were often misjudged — with the result that their aggressiveness was overestimated, and the extent to which the Soviet leadership was deterred from using nuclear weapons was underestimated.[96]

In crises, the existence of mutual vulnerability during the East-West conflict had a moderating effect on the behaviour of American and Soviet leaders. Although the political leaders of both countries approved nuclear warfighting strategies, sometimes used reckless nuclear rhetoric, and did not shy away from engaging in crises, the burden of responsibility weighed heavily when push came to shove.[97] But on the whole, nuclear deterrence cemented the East-West antagonism by aggravating the security dilemma and fuelling the arms competition. This latter conflict dimension remained acute, even after the geopolitical core conflict in Central Europe had been defused by the establishment of clear spheres of influence; this finally became the case when, in the early 1960s, the Berlin question lost its crisis potential.[98] Even when the Soviet Union under Gorbachev

Center for a New American Security, September 2017); James N. Miller, Richard Fontaine and Alexander Velez-Green, "Averting the U.S.-Russia War Path", *The National Interest* (March–April 2018); Greg Austin and Pavel Sharikov, "'Preemption Is Victory': Aggravated Nuclear Instability of the Information Age", *The Nonproliferation Review* 23, no. 5–6 (2016): 691–704; Erik Gartzke and Jon R. Lindsay, "Thermonuclear Cyberwar", *Journal of Cybersecurity* 3, no. 1 (2017): 37–48; Charles K. Bartles, "Russian Threat Perception and the Ballistic Missile Defense System", *Journal of Slavic Military Studies* 30, no. 2 (2017): 152–69.

92 Dieter Senghaas, *Abschreckung und Frieden. Studien zur Kritik organisierter Friedlosigkeit* (Frankfurt am Main: Europäische Verlagsanstalt, 1981), 87.

93 See Michael MccGwire, "Appendix 2: Nuclear Deterrence", *International Affairs* 82, no. 4 (2006): 771–84 (771).

94 See Richard Ned Lebow, "Deterrence: Then and Now", *Journal of Strategic Studies* 28, no. 5 (2005): 765–73.

95 See Beatrice Heuser, "Victory in a Nuclear War? A Comparison of NATO and WTO War Aims and Strategies", *Contemporary European History* 7, no. 3 (1998): 311–27. See further Jan Hoffenaar and Christopher Findlay, eds., *Military Planning for European Conflict during the Cold War. An Oral History Roundtable, Stockholm, 24–25 April 2006* (Zurich: Eidgenössische Technische Hochschule, 2007).

96 John Hines, Ellis M. Mishulovich and John F. Shulle, *Soviet Intentions 1965–1985*, vol. I: *An Analytical Comparison of U.S.-Soviet Assessments during the Cold War* (by BDM Federal, Inc., 22 September 1995, unclassified, excised copy), 68–71, https://nsarchive2.gwu.edu/nukevault/ebb285/index.htm (accessed 2 May 2018).

97 See Campbell Craig and Sergey Radchenko, "MAD, Not Marx: Khrushchev and the Nuclear Revolution", *The Journal of Strategic Studies* 41, no. 1–2 (2018): 208–33; William Burr, "U.S. Presidents and the Nuclear Taboo", *National Security Archive*, Briefing Book no. 611 (30 November 2017), https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2017-11-30/us-presidents-nuclear-taboo (accessed 2 May 2018).

98 See Richard Ned Lebow and Janice Gross Stein, *We All Lost the Cold War* (Princeton, NJ: Princeton University Press, 1994), 366–68.

took reconciliatory steps, these had only a limited impact.[99] It took until the end of the geopolitical and systemic conflict for the Soviet Union to no longer be perceived as a threat. But the nuclear deterrence system lived on. In the United States, nuclear deterrence had gained an ideological character — in the sense of a system of assumptions that have dogmatic status within the group that firmly believes in nuclear deterrence as the ultimate guarantee of peace between great powers.[100]

99 See Alan R. Collins, "GRIT, Gorbachev and the End of the Cold War", *Review of International Studies* 24 (1998): 201–19.

100 See James A. Stegenga, "Nuclear Deterrence: Bankrupt Ideology", *Policy Sciences* 16 (1983): 127–45.

Conclusions

US nuclear doctrine is based on flexible, graduated counterforce options. This "conventionalisation" can be understood as an attempt to make the threat and use of nuclear weapons strategically rational, and legally as well as morally acceptable. However, as the analysis has shown, this nuclear doctrine does not provide a way out of the dilemmas of nuclear deterrence. In the political debate, these dilemmas tend to be ignored, based on the confidence that nuclear deterrence will keep the peace. But this confidence in the stability of the deterrence system, as expressed in the talk of "nuclear peace", is based on downright dogmatic assumptions. Nuclear deterrence policy must prepare for its failure. The resulting search for offensive, damage-limiting options undermines the condition that, according to the logic of mutual vulnerability, is the pillar of strategic stability.

Nuclear deterrence is a construct in which assumptions play a fundamental role — hypotheses that lack an empirical basis.[101] Thus, a central question, namely that of credibility, has been answered differently for decades: Some believe that deterrent threats against a nuclear-armed opponent such as Russia can only be credible if the United States has the widest possible range of graduated options and escalation dominance. Others believe that, in a situation of mutual vulnerability, it is sufficiently dissuasive that a military confrontation entails incalculable escalatory risks that are hard to control.[102]

From the first viewpoint, which has shaped US nuclear doctrine, a variety of options are needed. In this sense, nuclear weapons are weapons of warfighting — and not, as occasionally heard in European debates, "political weapons of deterrence". Those who tend towards the second perspective conceive of deterrence foremost as a "competition in risk-taking". It is particularly important to use conventional forces to prevent a potential adversary from rapidly changing the military status quo and to confront him with the risk of entering a process with a potentially catastrophic outcome. In this sense, the credibility of extended deterrence rests not on the diversity of nuclear options, but on the political determination to take risks for the defence of allies. As these competing perspectives show, nuclear deterrence remains a highly speculative endeavour.

Abbreviations

CRS	Congressional Research Service (Washington, DC)
HSFK	Hessische Stiftung Friedens- und Konfliktforschung (Frankfurt am Main)
NATO	North Atlantic Treaty Organization
NPR	Nuclear Posture Review
OPLAN	Operation Plan
SALT	Strategic Arms Limitation Talks
SIOP	Single Integrated Operation Plan
START	Strategic Arms Reduction Treaty

101 See Robert *Jervis, The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, NY, and London: Cornell University Press, 1989), 182–83.

102 On this and the following, see Jervis, *The Illogic of American Nuclear Strategy* (see note 6), passim.